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ENTOMOLOGY.—*The genetics laboratory mite* Histiostoma laboratorium, *n.sp.* (*Anoetidae*).[1]

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(Communicated by ROBERT C. COOK.)

For years mites that thrive on *Drosophila* culture media, such as banana-agar or cornmeal-molasses-agar, have been serious pests in genetics laboratories. Of the several known forms that can successfully be cultured on these media, at least two families and several genera are represented. On the basis of observations made to date, however, the form described below is believed to be by far the commonest pest. That this is so is readily understood when we consider that this species has a short life cycle and a very effective migratory phase. The hypopus is resistant to desiccation, can crawl long distances in the laboratory, and can be dispersed over greater areas by becoming attached by suckers to *Drosophila* and other insects.

Although this species has been observed innumerable times, it appears not to have been previously described. The possible exception is Stanley G. Stolpe's description of *Histiostoma genetica* (*The life cycle of the tyroglyphid mites infesting cultures of* Drosophila melanogaster. Anat. Rec. **72**: (Suppl.: 133–134. 1938).His paper contains no illustrations and is so lacking in pertinent details that it is impossible to use it as a basis for establishing a new species. Studies are now in progress on the biology and cytogenetics of this new species and related forms.

Acknowledgments.—My thanks are due to Miss Dorothy Booth for her assistance in preparation of the finished drawings, to Dr. H. H. J. Nesbitt for his kindness in reading the manuscript, and especially to Miss Caroline O. Goode for her generous assistance in all phases of this study.

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Histiostoma laboratorium, n. sp.

Female (Figs. 1, 2, 5).—Average length of adult gravid females 0.46 mm, average width 0.31 mm. Gravid females over six days old from uncrowded cultures varied considerably in length and width. Length varied from 0.40 mm to 0.51 mm; width from 0.26 mm to 0.39 mm. Measurements refer to total length and width of body including gnathosoma but are exclusive of legs and setae extending beyond the body margins. Color of body whitish, semitransparent, and finely granular. The body of gravid females is rotund with sides gradually tapering anteriorly; nongravid females with sides of body more or less parallel. On the ventral surface the ring or sole-shaped structures characteristic of the family Anoetidae are conspicuous. The anterior pair is more or less sole-shaped and is located anteriad and slightly mesiad of trochanter III. The posterior pair is triangular to ring-shaped and lies in a position more mesiad than the anterior pair and on a line connecting trochanters IV. The anal slit is also conspicuous and lies in a median position somewhat near the posterior tip of the body. The vulva, very difficult to see, is a wide, transverse opening, slightly convex on the anterior edge, with the lateral margins almost in contact with the sole-shaped structures. The anterior lip is marked by a slight thickening of chitin. Two small chitinous processes from this lip seem to project posteriorly into the orifice, which can most easily be demonstrated by probing with a fine needle. The ventral body surface bears six pairs of very small setae located as follows: first pair, slightly above a line connecting trochanters II, median in position; second pair, slightly posteriad of the lateral margins of vulva; third pair, on a line connecting trochanters III and directly beneath the anterior sole-shaped structures; fourth pair, beneath and slightly lat-

erad of the posterior pair of ring-shaped structures; fifth pair, close to the anterior end of the anal slit; sixth pair, slightly below the posterior end of anal slit and more lateral than the fifth pair. All these setae are very fine but spinelike. The second and sixth pairs are hardly more than minute bristles and consequently seen with difficulty. In addition to these small setae there is a pair of posterior ventral submarginal setae, which are similar to the typical setae on the dorsal surface but somewhat shorter and thinner at the base. Also there is a pair of long anterior submarginal setae between legs II and III. Since the body is semitransparent the large eggs are easily seen. Fig. 1 shows a female with three eggs. As many as five or more well-formed eggs can be dissected from a fully gravid female. Ventrally the coxae together with the apodemata form conspicuous, ramifying structures but only their main outlines are shown in Fig. 1.

Dorsally an almost invisible sulcus posteriad of legs II can be seen. In the anterior or cervical region of the propodosoma faintly visible sclerotic thickenings form a characteristic mosaic pattern. In the posterior portion of the propodosoma a different type of pattern, consisting of rec-

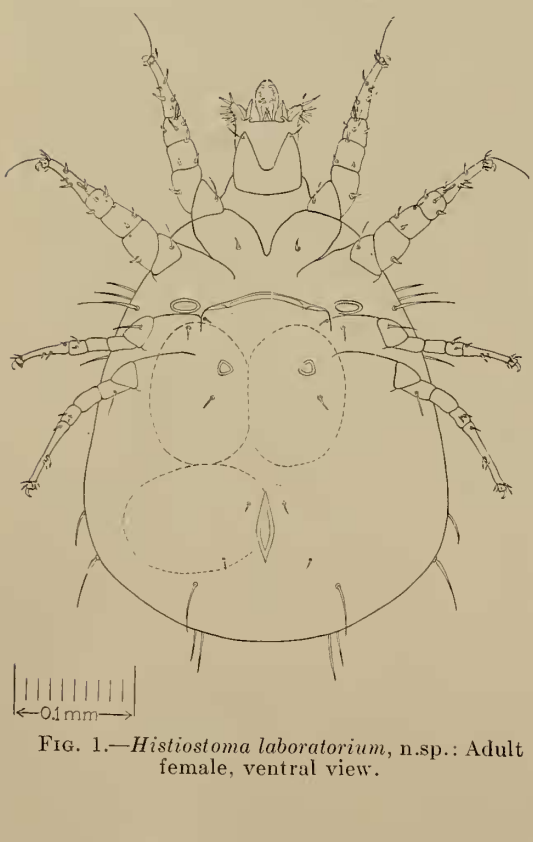

FIG. 1.—*Histiostoma laboratorium*, n.sp.: Adult female, ventral view.

tanglelike structures with the long axes parallel to the main axis of the body, is sometimes but more faintly seen than the mosaic pattern in the anterior region. Neither of these sclerotic patterns is shown in Fig. 2. Presumably together they form the so-called propodosomal shield frequently visible on other species. A pair of well-defined excretory organs lie in a lateral position posteriad of legs IV. The small excretory pore is found on a slight elevation, beneath which a rather large transparent colorless vesicle may be seen. On a level with the excretory organs and in the midline, the small but distinct poer of the bursa copulatrix is visible. Eight setae are found dorsally on the propodosoma: a pair of minute bristlelike rostral setae at the anterolateral corners, sometimes apparently overhanging the margin; a small pair of cervical setae; an inner and outer pair of propodosomatic setae, which are long and tapering. On the hysterosoma are five pairs of more or less median setae: first pair, just posteriad of the sulcus; second pair, one on each side of the bursa copulatrix; third, fourth, and fifth pairs placed progressively more posteriad with the fifth, or most posterior pair, marginal in position. There are six lateral setae on each side of the dorsum: two very close together in the humeral position and on same level with the ventral anterior submarginal seta; one slightly posteriad of leg III; one laterad of the excretory organ; one behind preceding; and one posterior marginal seta. Except for the three median pairs of setae on the propodosoma, the relative sizes of which are shown in Fig. 2, all the dorsal setae are approximately of the same length. These setae appear very much like the lighted end of a candle. They arise from short cylindrical protuberances, have narrow bases, which increase in diameter in the proximal portion of the setae, and taper abruptly to long fine points.

Because of its size, compactness, and complexity the gnathosoma is difficult to interpret. The details appear to be as follows: Dorsally the propodosoma overhangs the gnathosoma obscuring about one-third of it. The chelicerae are delicate structures, wide at the base, and tapering anteriorly. Each structure bears numerous teeth on its mesial side and terminates in a fine bristle with a minute knob, which is probably sensory in function. A few hairlike setae are found in a medial position possibly attached to the basal portion of chelicerae. The

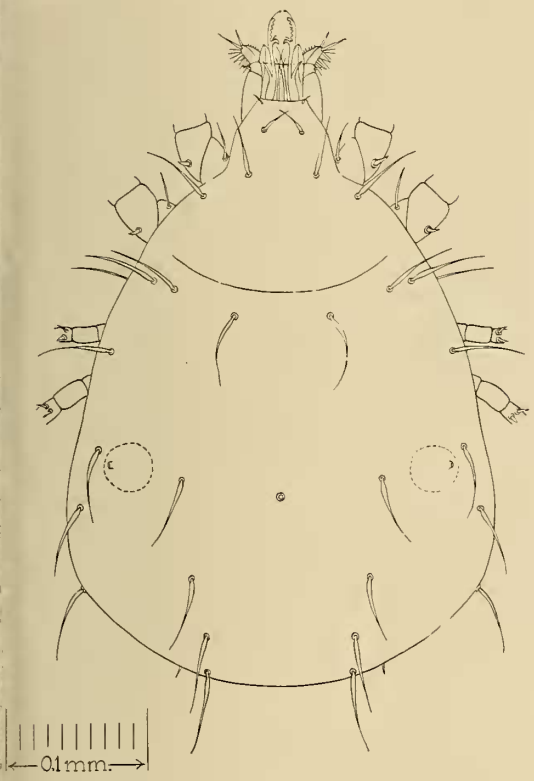

FIG. 2.—*Histiostoma laboratorium*, n.sp.: Adult female, dorsal view.

chelicerae are rapidly extended and retracted, apparently with a "raking" action, while the animal is feeding. The pedipalps appear to have three segments with indistinct lines of separation. Segment 1 bears one prominent spinelike seta. Another distinct but smaller seta can be seen slightly posteriad of this seta, arising either from the same pedipalpal segment or from a closely associated structure. Segment 2 bears one small seta. The basal segment is without setae, unless what appears to be a labial seta (Fig. 1) is actually a seta taking its origin from the base of the pedipalp. Mesially a pair of rather prominent pointed processes are found partially surrounding the chelicerae. Presumably these structures arise from the bases of the pedipalps. Extending from the pedipalps laterally are many extremely fine hairs, which apparently do not arise directly from the pedipalpal segments but from a thin membrane associated with it. Dorsally and mesially of pair of lacinialike structures are seen to be associated with the pedipalps.

Legs I and II are typically directed anteriorly and legs III and IV posteriorly. Locomotion is accomplished by a pulling action by I and II and a pushing action by III and IV. Legs I and II are approximately of equal length and are broader and much more robust than legs III and IV. The arrangement and type of setae and other structures of all the legs of the female are shown in Fig. 1. All setae are shown in this figure as taking their origin from the mesial sides of the legs. Fig. 5 is an enlarged view of leg I showing the setae in their true relationships. The setae, or portions of setae, lying on the lateral side are shown in broken lines.

It will be noted that only legs I and II have the very long hairlike setae at the tip of the tarsus. Otherwise the general arrangement and size of the claws, rudimentary caruncles, and setae at the distal end of the tarsus are the same for all legs. However, tarsus I has one large extra spine distally not found on other tarsi. In addition to these spines and spinules tarsus I has five other spines, tarsus II four other spines, and tarsi III and IV three other spines. Tarsus II also has a conspicuous striated macrosense organ at its proximal end. Tibiae I and II have three spines, and tibiae III and IV only two spines. In addition, tibia I has a macrosense organ of the same size and structure as found on the proximal end of tarsus II. Arising from the same base as this macrosense organ is found a rather

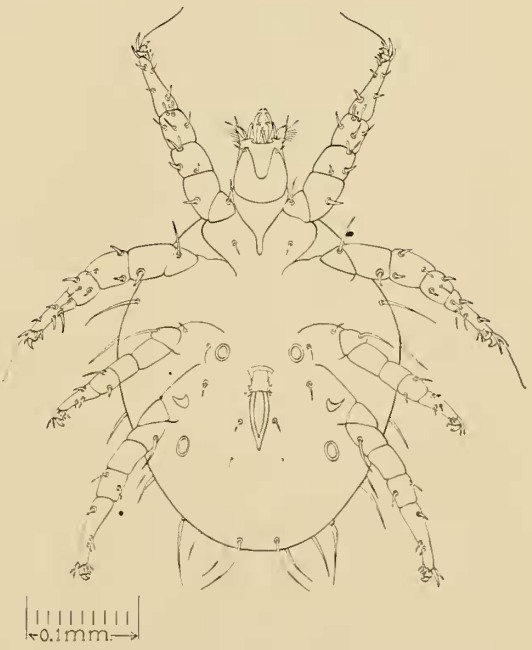

FIG. 3.—*Histiostoma laboratorium*, n.sp.: Adult male, ventral view.

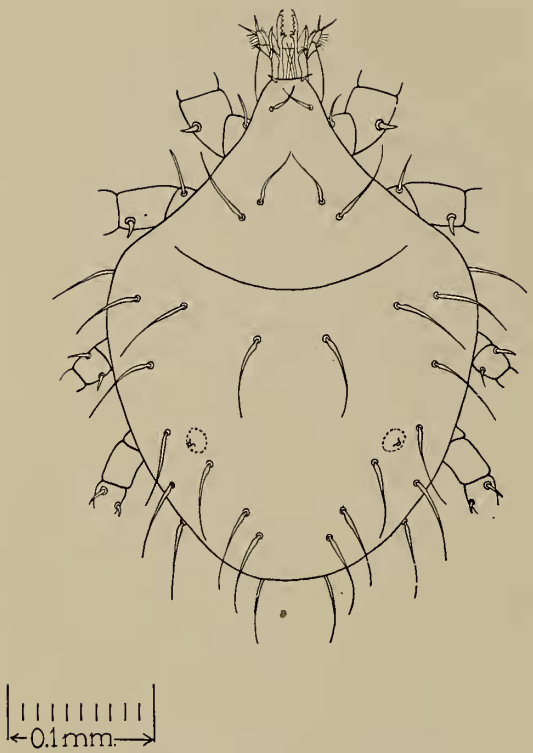

FIG. 4.—*Histiostoma laboratorium*, n.sp.: Adult male, dorsal view.

peculiar long bristle with a rounded tip. There are two spines of typical shape on genua I and II, and no spines on genua III and IV. On the distal end of genu I there is, in addition, a pair of setae arising from the same base; one of which is long and thin, and the other bristlelike and similar to the seta that arises from the base common to the macrosense organ of tibia I. Femora I and II have a single spine, femur III no setae, and femur IV one long almost hairlike seta. Trochanters I, II, and III have one seta, each very similar to that described for the femur IV. Trochanter IV has no seta.

Male (Figs. 3, 4, 5).—Average length of male exclusive of legs and setae extending beyond the body 0.38 mm; average width 0.23 mm. The variation in length of specimens over six days old is from 0.33 mm to 0.40 mm; variation in width 0.17 mm to 0.25 mm. There is a marked sexual dimorphism in this species, this being apparent even under low magnification. The male is shield-shaped, with a small tapering opisthosoma. This latter character emphasizes the conspicuousness of the legs, which are in fact more robust than those of the female, especially legs III and IV, even though the body of the male is much smaller. Also the male can be easily distinguished from a female under low magnification by the extension of his fourth pair of legs posteriorly in a virtually immobile position during locomotion. They are, however, efficient grasping appendages during copulation. Aside from the obviously more robust legs of the male, as pointed out above, the sexual dimorphism is evident in the details of the setae of the legs as well. This is true even though the general arrangement and number of the setae is the same in both sexes and there is no difficulty in establishing homologies. An example of these differences is seen when leg I of male and female are compared (Fig. 5). Dorsally the male differs from the female in a most unexpected manner, namely, the male has one less pair of long opisthosomatic setae. It is not certain which pair is missing in the male, but it may be assumed that it is the pair in the female lying on a level with the excretory organs and mesiad of them. The excretory organs of the male are more anteriorly placed than in the female. On the ventral surface of the male the same four ring-shaped structures of unknown function are found. The position of these structures differs considerably from those in the female. The anterior pair is ring-shaped in contrast to the sole-shape condition in the female and slightly posterior to trochanter III. This pair is also more mesiad. The posterior pair is much more laterad than in the female and posteriad of trochanter IV. The anal slit of the male also contrasts with position of the anal slit in the female. In the male it lies on the same level as trochanter IV, whereas in the female it is more posteriad. The number of small spinelike setae on the ventral surface of the male is the same as in the female. The arrangement of these setae appears to be quite different in the male and female at first glance. The pattern for the male is as follows: one pair slightly above a line between trochanters II, one pair on a level with trochanters III, one pair just laterad to the anterior ring-shaped structures, one pair more or less on a level with trochanters IV, and two pairs near the posterior part of the anus. The most posterior pair of anal setae are extremely small and difficult to see. Aside from the genital apparatus, the ventral surface of the male differs from the female in another feature. Near and slightly mesiad of trochanters IV an obscure boss, or elevation is found. It does not appear

to be a part of the apodemata in this region. The male genital opening is at the anterior end of the anal slit. It has two pairs of spinules at its posterior margin. On several occasions a very minute erectile structure in this region has been seen. This structure is presumed to be a penis. Normally it appears to be retracted into a groove in the anterior end of the anal slit, although the above structures are not entirely clear. During copulation the male mounts the female dorsally in such an attitude that the genital apparatus is in juxtaposition with the bursa copulatrix of the female. All other features of the male not described above, such as the gnathosoma, are essentially the same as in the female.

Hypopus (Figs. 5, 6, 7).—Average length exclusive of legs 0.18 mm; width 0.14 mm. Variation in length from 0.16 mm to 0.20 mm; width 0.12 mm to 0.16 mm. Color light to dark amber. The hypopus is apparently mouthless, the gnathosoma being represented chiefly by a pair of antennalike setae, which arise from a common base. The legs are extremely long for the size of the body, enabling the hypopus to crawl rapidly over the culture medium or other surfaces. The hypopus is very resistant to desiccation and is not harmed after long periods in a completely liquid medium.

The most prominent structure ventrally is the suctorial plate. Eight conspicuous discs are seen in this plate; an anterior pair of medium

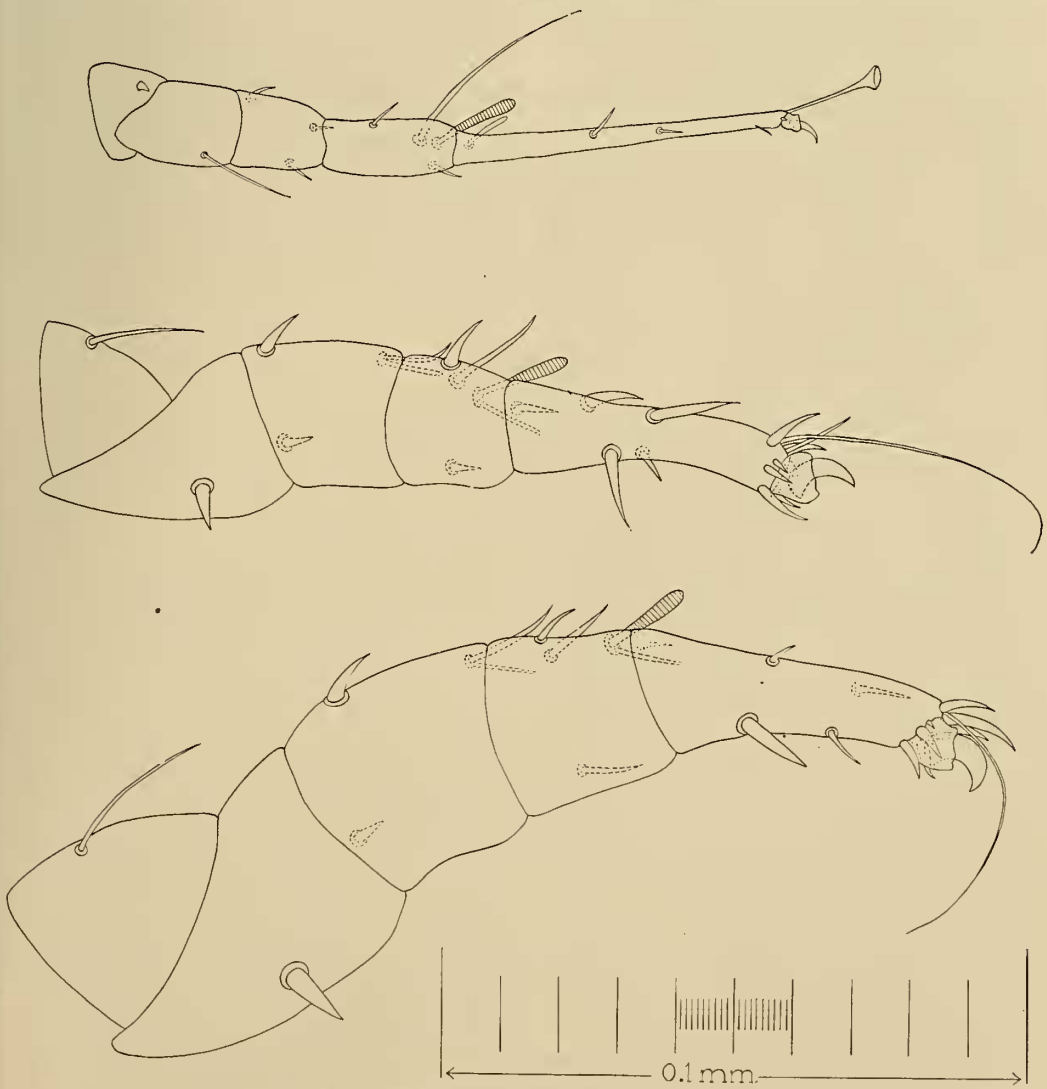

FIG. 5.—*Histiostoma laboratorium*, n. sp.: Legs I, hypopus (upper figure), adult female (middle), adult male (lower).

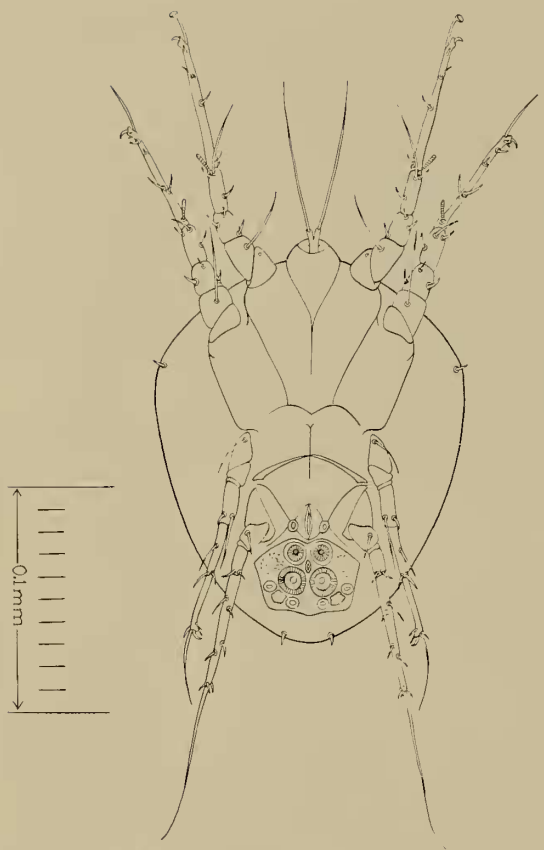

FIG. 6.—*Histiostoma laboratorium*, n.sp.: Hypopus, ventral view.

size, a middle pair of large size, and a posterior row of four small ones. The anterior pair of discs may be extended three or four times their diameters and are obviously suckers. The middle pair appear to be suckers also but have not been seen in an extended position. The structure of the four small posterior discs is different from the above discs, and it appears very doubtful if they can function as suckers. In addition to the above eight discs there is a pair of very faint ringlike structures, one on each side of the anterior suckers. They appear to be incipient suckers, but there is no real evidence for this. In each posterolateral corner of the plate there is a faintly visible structure of unknown function. Directly anterior to the suctorial plate there is a slit having the appearance of the anus in the adult. On each side of this slit is a disc somewhat similar in size and shape to the four discs on the posterior margin of the suctorial plate. Also there are two pairs of very faint rings between the slit and the discs mentioned above. Ventrally two pairs of minute submarginal setae are observed. One pair is anterolaterad, and one pair at the posterior end. The coxae and apodemata are outlined in the ventral view of the hypopus (Fig. 6). Dorsally a distinct sulcus is present. The propodosoma has one row of four small setae. The hysterosoma has a faintly striated, shagreened appearance. There are four rows of small setae on the hysterosoma; six setae in the first or anterior row, six in the second, four in the third, and only two in the last row. The hypopus is finely granular both dorsally and ventrally. The number and arrangement of the leg setae, and other leg structures of the hypopus, are not, as expected, identical with the adult. However, there is no difficulty in homologizing many of these structures with those of the adult. These setae and structures are shown for all the legs in Fig. 6. and an enlarged view of leg I is shown in Fig. 5. Mention many now be made of some of the more conspicuous differences between the hypopus and adult legs. A single claw is found on the tarsus of each of the first three legs, but not on tarsus IV. In the latter there is an extremely long, thin seta instead of

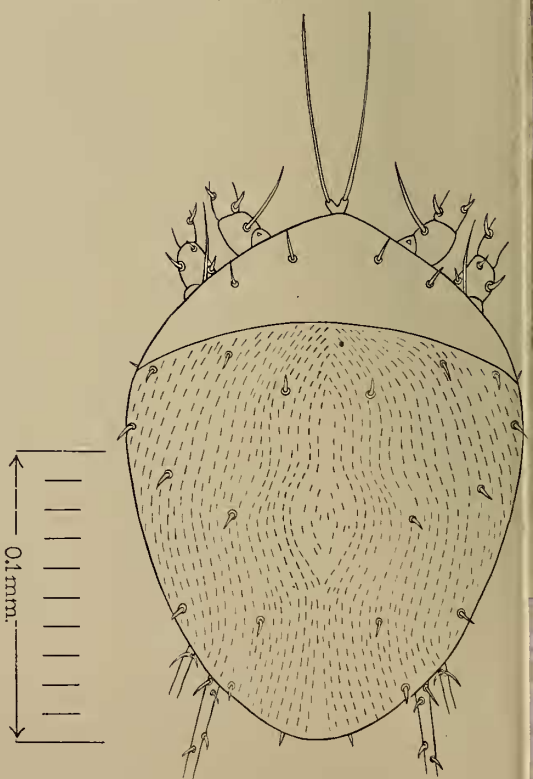

FIG. 7.—*Histiostoma laboratorium*, n.sp.: Hypopus, dorsal view.

a claw. Tarsi II and III have rather long hairlike setae similar in appearance to those on tarsi I and II of the adult. Tarsus I has a structure with a shape similar to the end of a golf club substituted for similarly placed setae on tarsi II and III. This structure could possibly function as either a suction cup or a sensory organ. The tarsal spinules of adult legs appear to be missing in the hypopus. These could be present but of such a minute size as to be overlooked. The macrosense organs are seen in a similar position to those of the adult, although no bristlelike setae have a common origin with them as seen in the tibial macrosense organ of leg I of the adult. Only trochanter III of the hypopus has a seta. However, femora I, II, and IV have long setae somewhat similar in shape and size to the setae on trochanters I, II, and III of the adult. Trochanter I has an extremely minute spicule reminding one of an incipient seta. The interpretation of the segments of leg III and IV is shown in Fig. 6. If this interpretation is correct genua III and IV are represented in the hypopus by small, almost vestigial segments.

Type.—Holotype male, allotype female and hypopus, and several paratypes of both sexes and hypopus are being deposited in the U. S. National Museum.

Remarks.—These studies were based on many specimens, conforming to type forms. The most satisfactory observations were made on living specimens mounted in Methocel, which slows but does not kill for as long a period as several hours. Colonies of this species were started from specimens originally found in a *Drosophila* culture from a biological supply house.

This species is easily cultured on any of the common *Drosophila* culture media, such as corn-meal-molasses-agar. At room temperature the life cycle is completed in 5 to 6 days. Unfertilized eggs obtained from isolated virgin females give rise to males only, furnishing another instance of haploid parthenogenesis in the Acarina. It is suspected that the natural distribution of his species is widespread. This statement is based on preliminary collections in the vicinity of Richmond, Va., as well as the general observation of its frequent occurrence in genetic laboratories in many parts of the United States. The normal variation in size of mites of the same species of a family when cultured under optimum condition is not known. However, the size range as noted above appears to be unusually great, leading one to suspect genetic differences are involved. This and other aspects of the biology of this species are now under investigation.

ENTOMOLOGY.—*A synopsis of the chloropid genera* Chaetochlorops *and* Eugaurax (*Diptera*).[1]

CURTIS W. SABROSKY, Bureau of Entomology and Plant Quarantine.

In the family Chloropidae, a formula of 1+2 notopleural bristles (one anterior and two posterior) occurs so generally that it might almost be cited as a family character. Some genera and species have 1+1, or occasionally 0 + 1, but even in these cases close inspection sometimes shows that the difference is only one of degree and that there is present in the expected position a single hair or hairlike bristle corresponding to the apparently missing notopleural.

In the New World two genera, *Chaetochlorops* and *Eugaurax*, show unexpected numbers of notopleurals, the formula ranging from 2 + 3 to 3 + 17, with correspondingly greater numbers than usual along the posterior margin of the mesonotum and on the sides of the scutellum. In view of their distinctive habitus, the two genera may conveniently be considered together in this paper. Actually they are derived from quite different lines, however, as *Chaetochlorops* belongs with the *Epimadiza-Goniopsita-Polyodaspis* complex of genera, whereas *Eugaurax* is near *Conioscinella*.

The two genera may be separated by a number of significant characters, besides the useful though perhaps superficial difference in color.

KEY TO CHAETOCHLOROPS AND EUGAURAX

1. Postvertical bristles stout, straight, parallel or slightly diverging, directed slightly caudad; eye bare, at most a few exceedingly minute hairs visible under high magnification; front rather shining (the German "fettglänzend"),

[1] Received March 30, 1950.